ParaView Enables the Remote Analysis of 1 Billion Element Mesh

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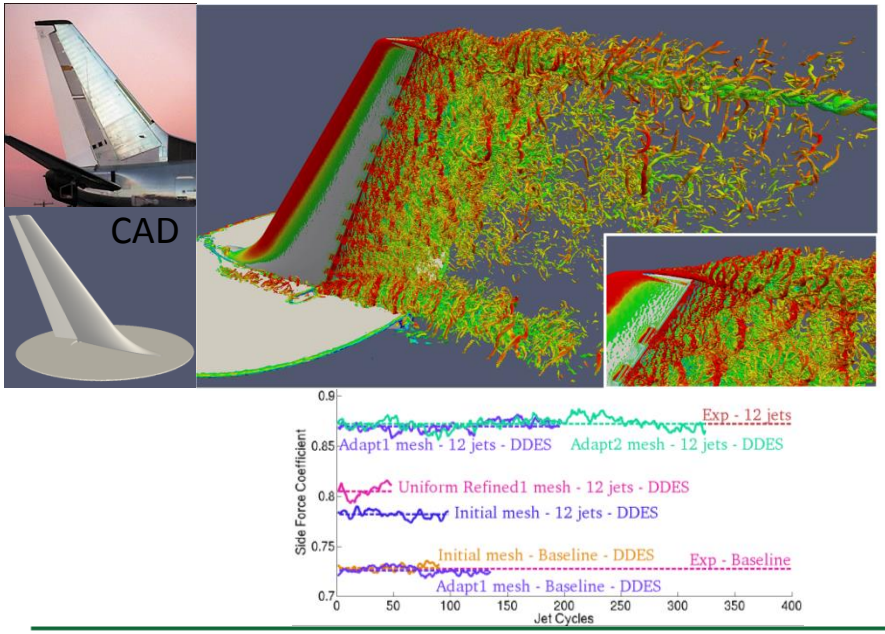
Objectives

- Simulate and analyze synthetic jet flow control using the finite element method
- Use mesh adaptivity to fully resolve all required physical scales
- Analyze and visualize the resulting 1 billion element mesh per time step solution to study the effect of flow control

Impact

- Synthetic jet flow control can dramatically alter aerodynamic flow with very small power input.
- Advancing our understanding of the flow mechanisms involved is essential to developing novel flow control techniques



Accomplishments - FY13

- Computations confirm experimental finding that flow control can produce 20% improvement/increase in side force
- Demonstrated that unsteady, separated flow with active flow control is not accurately simulated with time-averaged models
- Using ParaView on ALCF Tukey enabled researchers to remotely analyze and visualize their data, an essential part of the discovery process at scale

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